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10/814,695	03/30/2004	Tae-Woong Koo	INTEL1510 (P18520)	7238

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EXAMINER

YU, MELANIE J

ART UNIT	PAPER NUMBER
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1641

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/814,695

Applicant(s)

KOO ET AL.

Examiner

Melanie Yu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-55 is/are pending in the application.
- 4a) Of the above claim(s) 13-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-12 and 47-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: <u>20070629</u> |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's amendment filed 23 April 2007 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-13 and 47-55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the preamble of claim 1, the metallic colloid is defined as comprising particles comprising a metal and an organic molecule. The body of claim 1 defines the metallic colloid having a particular method of making including preparing a solution of cations of metal and a reducing agent and subsequently heating the solution. The claim then attaches an organic molecule to the metallic colloid. It is unclear whether the claim intends to define the metallic colloid as both the particle and the organic molecule or whether the metallic colloid and method of making make just the particle while the organic molecule is a separate entity. The claim is interpreted as the metallic colloid being just the particle prepared by the recited method and the organic molecule is a separate entity from the metallic colloid.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. Claims 1, 3, 4, 8-13, 47-52 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kidwell et al. (US 5,384,265) in view of McCormick, III et al. (US 2003/0199653).

Kidwell et al. teach a method for producing metallic colloids comprising: preparing an aqueous solution having room temperature (solution has not yet been heated, and is therefore at room temperature), the aqueous solution including metal cations (platinum chloride) and a reducing agent (ascorbic acid) by dissolving, at room temperature (solution is still not heated), the metal cations and the reducing agent in water (col. 6, lines 56-61; col. 10, lines 28-33); and then heating the aqueous solution with an oven to near boiling at 85°C (col. 6, lines 61-64; col. 10, lines 33-35), which is encompassed by the recited about 95°C, and an organic molecule (protein) attached to the metallic colloid (col. 6, lines 62-68). Kidwell et al. fail to teach the organic molecule comprising a moiety that has an affinity for the metallic colloid and another moiety having an affinity for a biomolecule.

McCormick, III et al. teach modifying a metallic nanoparticle with cystamine prior to functionalizing the particle with biomolecules for binding (par. 79-81), which contains sulfur, has a molecular weight of less than about 500 Daltons and contains a thiol moiety, in order to form stable, metal nanoparticles in a facile manner.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include on the metallic colloid of the method of Kidwell et

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al., a nanoparticle modified with a cystamine organic molecule between the metal nanoparticle and the biomolecule with binding affinity for the analyte as taught by McCormick, III et al., in order to provide a nanoparticle with increased stabilization in solution. Although Kidwell et al. in view of McCormick, III et al. do not specifically teach the metallic colloid having a Raman signal that is at least 50% or about 140% to 180% greater than that of a silver colloid prepared by a titration method, wherein a boiling silver nitrate is titrated with a sodium citrate solution to produce the silver colloid, such a limitation is drawn to an inherent property of the metallic colloid. Because the claim does not specify what method steps are required to provide this property and the metallic colloid of Kidwell in view of McCormick, III is prepared by the method recited in claim 1 and not by a titration method, the colloid of Kidwell in view of McCormick III would have the recited property.

With respect to claims 3 and 4, Kidwell et al. teach the aqueous solution heated 90 minutes (col. 10, lines 33-35), which is encompassed by the recited at least 30 and at least 60 minutes.

Regarding claims 49-51, the limitations of claims 49 and 50 are drawn to properties of the final metallic colloids by the method of claim 1. No further method steps appear to be required to produce a higher SERS signal, and it appears that any metallic colloid produced by the method of claim 1 comprises the recited properties. Therefore the metallic colloids produced by the method of Kidwell et al. in view of McCormick III et al. comprise the recited properties. Kidwell et al. also teach the cation and reducing agent concentrations being 0.2 M (col. 6, lines 56-68), which is encompassed by the recited about 0.5 M.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kidwell et al. (US 5,384,265) in view of McCormick, III et al. (US 2003/0199653), as applied to claim 1, further in view of Albrecht et al. (US 6,699,507).

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Kidwell et al. in view of McCormick, III et al. teach a reducing agent of ascorbic acid, but fail to teach the reducing agent being citrate or borohydride.

Albrecht et al. teach that a reducing agent may be ascorbic acid, sodium citrate or sodium borohydride (col. 4, lines 58-67), in order to provide formation of colloidal particles.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute for ascorbic acid of Kidwell et al. in view of McCormick, III et al., sodium citrate or sodium borohydride as taught by Albrecht et al. One having ordinary skill in the art would have been motivated to make such a change as a mere alternative and functionally equivalent reducing agent technique and since only the expected reducing agent effect would have been obtained. The use of alternative and functionally equivalent techniques would have been desirable to those of ordinary skill in the art based on the economics and availability of components.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kidwell et al. (US 5,384,265) in view of McCormick, III et al. (US 2003/0199653), as applied to claim 1, further in view of Smith et al. (US 2004/0234958).

Kidwell et al. in view of McCormick, III et al. teach a method for producing metallic colloids and heating using an oven, but fail to specifically teach the use of microwaves.

Smith et al. teach temperature control of heating metallic colloids using a microwave generator (par. 87), in order to provide efficiency when mixing solutions.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the method of Kidwell et al. in view of McCormick, III et al., heating using microwaves as taught by Smith et al., in order to provide faster heating.

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6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kidwell et al. (US 5,384,265) in view of McCormick III et al. (US 2003/0199653), as applied to claim 1, further in view of Strohmaier et al. (US 6,640,970).

Kidwell et al. in view of McCormick, III et al. teach a method for producing metallic colloids wherein heating of an aqueous solution is performed by an oven to heat to 85°C, but fail to specifically teach a convection oven.

Strohmaier et al. teach a convection oven to heating a solution to a temperature of 85°C to produce colloids.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to use for an oven in the method of Kidwell et al. in view of McCormick III et al., a convection oven as taught by Strohmaier et al. One having ordinary skill in the art would have been motivated to make such a change as a mere alternative and functionally equivalent heating technique and since only the expected heating effect would have been changed and the same heating temperature would have been obtained. The use of alternative and functionally equivalent techniques would have been desirable to those of ordinary skill in the art based on the economics and availability of equipment.

7. Claims 1, 3, 4, 8-13 and 47-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kidwell et al. (US 5,384,265) in view of Reda et al. (US 2004/0250750, PCT application was filed in English and therefore has a priority date of 26 August 2002).

Kidwell et al. teach a method for producing metallic colloids comprising: preparing an aqueous solution having room temperature (solution has not yet been heated, and is therefore at room temperature), the aqueous solution including metal cations (platinum chloride) and a reducing agent (ascorbic acid) by dissolving, at room temperature (solution is still not heated), the metal cations and the reducing agent in water (col. 6, lines 56-61; col. 10, lines 28-33); and then heating the aqueous solution with an oven to near boiling at

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85°C (col. 6, lines 61-64; col. 10, lines 33-35), which is encompassed by the recited about 95°C, and an organic molecule (protein) attached to the metallic colloid (col. 6, lines 62-68) and aggregating the metallic colloids (col. 6, lines 40-55). Kidwell et al. fail to teach the organic molecule comprising a moiety that has an affinity for the metallic colloid and another moiety having an affinity for a biomolecule.

Reda et al. teach an organic molecule comprising a bi-functional organic molecule having a first moiety that has an affinity for a biomolecule, wherein the organic molecule is cystamine (par. 68), which contains sulfur, has a molecule weight of less than 500 Daltons, and contains a thiol or disulfide moiety according to the instant specification and the metallic colloid formed by aggregating a plurality of metallic particles to form clusters ranging from about 4 nm to 10 microns, which encompasses the recited range of about 50 to 200 nm (par. 13), in order to provide aggregation of gold nanoparticles that are touching each other and are conductive.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include on the metallic colloid of the method of Kidwell et al., a nanoparticle modified with a cystamine organic molecule between the metal nanoparticle and the biomolecule with binding affinity for the analyte as taught by Reda et al., in order to provide better aggregation of nanoparticles in a solution that has a high concentration of nanoparticles and to provide a stable solution of nanoparticle aggregates. Although Kidwell et al. in view of Reda et al. do not specifically teach the metallic colloid having a Raman signal that is at least 50% greater than that of a silver colloid prepared by a titration method, wherein a boiling silver nitrate is titrated with a sodium citrate solution to produce the silver colloid, such a limitation is drawn to an inherent property of the metallic colloid. Because the claim does not specify what method steps are required to provide this property and the metallic colloid of Kidwell in view of Reda et al. is prepared by

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the method recited in claim 1 and not by a titration method, the colloid of Kidwell in view of Reda et al. would have the recited property.

With respect to claims 3 and 4, Kidwell et al. teach the aqueous solution heated 90 minutes (col. 10, lines 33-35), which is encompassed by the recited at least 30 and at least 60 minutes.

Regarding claims 49-51, the limitations of claims 49 and 50 are drawn to properties of the final metallic colloids by the method of claim 1. No further method steps appear to be required to produce a higher SERS signal, and it appears that any metallic colloid produced by the method of claim 1 comprises the recited properties. Therefore the metallic colloids produced by the method of Kidwell et al. in view of McCormick III et al. comprise the recited properties. Kidwell et al. also teach the cation and reducing agent concentrations being 0.2 M (col. 6, lines 56-68), which is encompassed by the recited about 0.5 M.

Response to Arguments

8. Applicant's arguments filed 23 April 2007 have been fully considered but they are not persuasive. Applicant argues that the Raman signal property inherent to the combination of Kidwell and McCormick cannot be applied because the inherency is based on a combination of references. Applicant further argues that the nobody prior to this invention had established that the metallic colloids produced by the method of this invention had the property and it is not correct to assert in hindsight gained based on the *combination of references*. Applicant's argument is not persuasive because as described in the rejection, the primary reference of Kidwell teaches the recited method of preparing a solution comprising cations of the metal and a reducing agent by dissolving the cations and reducing agents and subsequently heating the solution to produce the metallic colloid, in its entirety. McCormick is relied upon only for the attachment of an organic molecule to the metallic

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colloid, which, according to the claim, is not an element that causes the metallic colloid to have a Raman signal greater than that of a titration method. Therefore, the properties of the metallic colloid made by the method of Kidwell would also have the inherent Raman signal property, with or without the organic molecule of McCormick. Therefore, the metallic colloid produced by Kidwell would have the same Raman properties as that of the instant claims because the metallic colloids of Kidwell and the metallic colloids of the instant invention are produced by the same methods. The combination of the Kidwell and McCormick references does not apply to the method of making the metallic colloid and instead applies to the combination of the metallic colloid and the organic molecule, which is not included in the inherency argument. Applicant does not argue how the metallic colloid produced by the method of Kidwell 1) is different from that of instant claim 1, 2) does not have the recited Raman signal property or 3) recite which method step produces this property and is not taught by Kidwell.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie Yu whose telephone number is (571) 272-2933. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Melanie Yu
Patent Examiner
Art Unit 1641


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